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plinary form. They have quite generally followed a plan which has so good a warrant as the example of the Johns Hopkins University. The biological work was there developed along zoological lines while the botanical remained in a condition perhaps to be termed inadequate. It certainly seems better to place some lines of instructions upon a fairly adequate basis than to make all inadequate by trying to cover them all. If geology cannot be taught as a matter of discipline without sacrificing biological, chemical or physical instruction, should it be excluded altogether? I cannot think so, geology has a value as information and may be so imparted as not to give the student any undue sense of having learned all that can be learned. That it is so treated in many of our colleges and that the results are good I wish to bear most emphatic testimony. Few institutions can feel that they are accomplishing all that they would like to do. It is, however, true that in many a small college teachers of real power and inspiration are sacrificing the opportunity to make themselves known and recognized in their sciences in order that they may make their instruction more adequate. That they are succeeding is clearly evidenced by the steady stream of men who are passing from their institutions in the graduate courses of the universities.

L. W. CHANEY, JR.

CARLETON COLLEGE,  
NORTHFIELD, MINN.

#### SCIENTIFIC LITERATURE.

*Life Histories of North American Birds, from the Parrots to the Grackles*, with special reference to their breeding habits and eggs. By CHARLES BENDIRE, Captain and Brevet Major U. S. A. (Retired). Smithsonian Contributions to Knowledge. Large 4to, pp. 518, col. pls. 7. Dated 1895; published September, 1896.

Probably no work on American birds since Audubon's Ornithological Biographies has been looked for with greater eagerness than the second volume of Bendire's 'Life Histories of North American Birds.' The first volume was a surprise, both to ornithologists and to the public. A good book was expected, but no one was prepared for the great mass of new infor-

mation it contained or for the high technical knowledge shown in its preparation. The colored plates of eggs were the finest ever produced, and the demand for the work was so great that, although sold at the relatively high price of \$7.50, the edition was soon exhausted. Naturally, the appearance of the second volume has been anxiously awaited by all classes of bird lovers from the technical ornithologist to the popular observer. On running over its handsome pages one is impressed by the fact that it is even better than the first, and that the plates also, if possible, are superior.

The scope of the work is comprehensive. All of the birds of the American Continent occurring north of Mexico are included. The first volume contained 416 large quarto pages and 12 colored plates, and treated of the Grouse, Pigeons, Hawks and Owls—146 species and subspecies in all. The present volume comprises 518 pages and 7 colored plates of eggs. It treats of the Parrots, Cuckoos, Anis, Roadrunner, Trogon, Kingfishers, Woodpeckers, Night-hawks, Poor Wills, Swifts, Hummingbirds, Flycatchers, Larks, Magpies, Jays, Crows, Orioles and Blackbirds—in all about 200 species and subspecies. The classification and nomenclature of the A. O. U. Check List are followed and references are given to the first name of the species and to the combination adopted. Following this brief synonymy is a complete concordance to the numbers the species bears in each of the five check lists from Baird's original list of 1855 to the American Ornithologists' Union list of 1895. The geographic range of the species is then summarized in a brief paragraph and is afterward given in greater detail, along with the dates of arrival at different points in its migratory range, the relative abundance of the species in different localities, and the local names by which it is known. Much attention is given to food and breeding habits, the accounts of which are graphically written and, as a rule, form the greater part of the biographies. Except in the very few instances in which the eggs are unknown, the history closes with a description of the nest and eggs, with average, maximum and minimum measurements (both in millimeters and inches).

The greater part of Major Bendire's life has

been spent in the West, where, as a military officer, he has been stationed at remote outposts from the Mississippi Valley to the Pacific Coast, and from Arizona to Oregon. During his army life he took part in various Indian wars and had command of various exploring expeditions, traveling thousands of miles on horseback over the deserts and mountains of the far west. He thus had very exceptional opportunities for the study of birds in the field. On his retirement from the army he came east, at the solicitation of Prof. Baird, and was made Honorary Curator of the Department of Oology in the United States National Museum, which position he still holds. When he came he brought with him the largest and most valuable collection of birds' eggs ever gathered by one person in America, a collection numbering about 15,000 eggs.

Professor Baird, knowing the extent and value of Major Bendire's field notes, asked him to write a work on our birds, with special reference to their breeding habits, but unhappily did not live long enough to see even its beginning.

Since coming east Major Bendire has spent several summers in the field, chiefly in the Adirondack region in northern New York, thus supplementing his knowledge of the habits of western birds by studies of our eastern species. He is a keen observer and his wide field experience has made him personally familiar with nearly all the species of which he writes. In addition to his own notes he has secured from others a large mass of unpublished manuscript prepared expressly for the present work. The quantity of this original contributed matter is surprising and is vastly greater than that brought together by any author since the time of Audubon.

The work does not require comparison with any other, because no other covers the same ground. It is not in any sense a technical treatise and does not contain descriptions of the birds themselves, though in the case of closely related geographic races the points of difference are often clearly stated. On the other hand, unlike the works of Audubon and Wilson, it contains little in the way of personal narrative, although now and then the pages are enlivened by an anecdote or entertaining bit of personal experience. So far as the geographic distribu-

tion, food habits and breeding habits go, it is not too much to say that the work fairly represents the state of knowledge on these subjects at time of going to press. The proofs of the second volume were read more than a year ago (in June 1895) and the book is dated 1895, but through unfortunate delays in the Government printing office, it did not appear till September of the present year (1896). The reprehensible practice of some of the departments of Government of permitting their publications to bear a date a year or more anterior to the actual date of publication, cannot be too strongly condemned.

Bendire's 'Life Histories' is the only book ever published that contains reliable 'down to date' accounts of the food habits and breeding ranges of our birds, with descriptions of their nests and eggs. Special attention has been given to the geographic distribution of the various species, but the ranges are defined by means of political and geographical boundaries without reference to the faunal areas. The work as a whole is indispensable to students of North American birds and will long remain the standard authority on the subjects of which it treats. Both the author and the Smithsonian Institution are to be congratulated on the excellence of the colored plates, which were drawn by John L. Ridgway and reproduced by Ketterlinus.

C. H. M.

*Economic Entomology for the Farmer and Fruit Grower*, and for Use as a Text-book in Agricultural Schools and Colleges. By JOHN B. SMITH, Sc. D. J. B. Lippincott Company, Philadelphia. 1896.

Dr. Smith's experience as a teacher of economic entomology and as an investigator in this field has eminently fitted him for the authorship of this volume, just received from the press. Entomologists have been very fortunate during the past two years in witnessing the publication first of Comstock's admirable 'Manual for the Study of Insects,' second, Dr. Sharp's excellent consideration of the class 'Insecta' in Volume V. of the Cambridge Natural History and lastly of the volume now before us. Dr. Smith, in writing specifically for the farmer and fruit grower, and for the students in agricultural colleges and schools has